



Project Hawkeye and the U.S. Coast Guard's First Sector Command Center

*The evolution of a system for improved
Maritime Domain Awareness.*

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In 2004, the U.S. Coast Guard embarked on a revolutionary transformation of its shoreside command and control activities. Through an aggressive implementation plan, operational commands and marine safety offices were merged to form a unified command structure called a sector. The sector philosophy embraced an operating environment characterized by information sharing and partnership between historically distinct efforts within the Coast Guard, then designated as operations (O) and marine safety (M).

At the heart of this reincarnation was the evolution of the sector command center (SCC). Building on the successful history of the response oriented group operations center, the SCC aligned itself under the sector construct by assuming a new role in prevention and awareness, key activities in homeland security efforts. Unlike its traditional response activities, which were largely event-driven, the SCC's evolving role in maintaining awareness required a proactive posture and efforts aimed at better understanding of the complete maritime picture for the area of responsibility, particularly in the port and near-coastal environment.

New Tools

Recognizing the need for greater, near-real-time awareness of port and coastal maritime activities, the Coast Guard began an aggressive prototype development effort. In partnership with the DHS Office of Science and Technology, project Hawkeye was born. Aimed at providing rapid technology insertion, Hawkeye's goal was to identify off-the-shelf technolo-

gies that could be quickly integrated to deliver improved awareness and information sharing for the evolving sector command center.

The first prototype was delivered in May 2004 to the newly established SCC Miami. It consisted of port and coastal radar installations, electro-optical and infrared cameras, automatic identification system (AIS) base stations, and an integrated desktop environment for management of the sensors. In addition, web-based tools were introduced to promote port partner interoperability and information sharing. The Hawkeye system's initial installation provided port-level coverage for the cities of Miami and Fort Lauderdale and coastal coverage for the areas in between.

Numerous Benefits

For a command center that had relied primarily on message traffic and phone calls, the introduction of an integrated system with cameras, radar, and vessel tracking, the benefit was immediate. In fact, R & D center analysis indicates that command center awareness of port events immediately went from 10 percent to 70 percent. The sector command center discovered new uses for Hawkeye on a regular basis that included prevention of launching unnecessary assets, improved coordination with other government agencies, and forensic analysis for investigations. A few examples are:

Prevention

In August of 2005, Sector Miami received a report of a migrant landing on Sands Key in Southern

Biscayne Bay on the property of the Biscayne National Park. Notifications were made to Miami-Dade Police Department and National Park Service, who had vessels equipped with “blue force” (law enforcement) tracking near the area. Both agencies were quickly on scene and established communications with Sector Miami, verifying that all persons were accounted for. Sector Miami refrained from launching an asset when it was confirmed that the agencies on scene had the situation under control, instead Sector Miami coordinated for emergency medical services to meet the migrants, once they were transferred to a local marina.

In June of 2006 just before an NBA finals game at the waterfront American Airlines Arena, a boat fire erupted. The boat fire, rescue of the persons in the water, and eventual salvage were all captured by Hawkeye cameras. The footage provided situational awareness to the sector command center, and allowed the SCC to stand down a requested HH-65,

as the watchstanders observed both persons in the water being recovered by a good Samaritan. Additionally, the high-quality recorded video was supplied to the local media and later aired nationally.

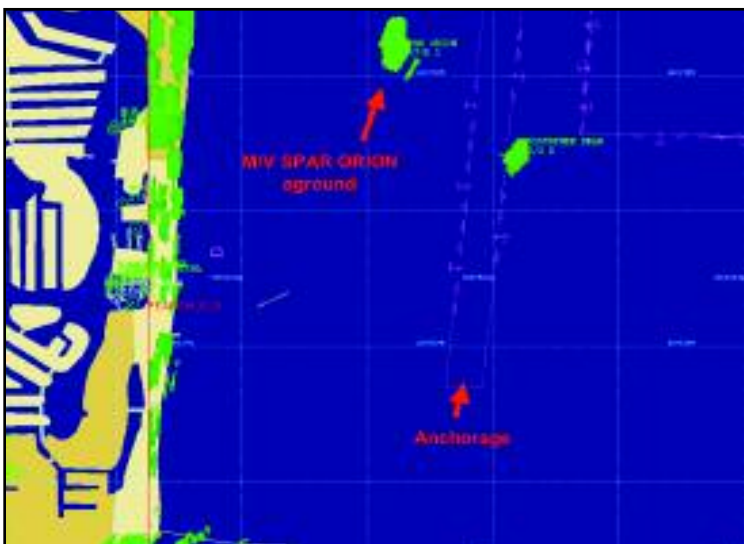
Coordination

In June 2005, the Organization of American States (OAS) foreign delegate meeting convened in Fort Lauderdale, Fla., at the waterfront Broward Convention Center. President Bush, Secretary of State Condoleezza Rice, and foreign ministers from 34 countries in the Western Hemisphere attended this gathering—the first OAS gathering in the United States in 70 years. The Hawkeye system provided port and near-coastal maritime awareness by tracking and coordinating more than 25 “blue force” (law enforcement) assets from local, state, and federal agencies patrolling waters in and around security zones adjacent to the convention center.

Infrared and long-range optical cameras provided watchstanders at the maritime operations center real-time views of port conditions and vessel movements. This event also presented some important lessons on how to use blue force tracking (BFT). First, that the technology is most beneficial when all of the assets in a given area or operation are outfitted. Another BFT lesson learned was the need for a simplified hardware solution that would draw less power and be easier for operators to operate. Initially this required a separate magnetic status board to be maintained in tandem with the BFT display. These recommendations were subsequently incorporated into the next generation BFT solution that is currently being fielded.



Hawkeye sensor coverage of the port of Miami. USCG photo by LTJG Will Rogers.



Hawkeye screen capture from grounding of M/V Spar Orion, with radar and AIS track visible. USCG graphic.

Forensics

One of the first cases where the sector realized the positive impact of the Hawkeye installation was following the grounding of the M/V *Federal Pescadores* in October of 2004. In this high-profile event, the vessel ran aground with a cargo of 39,000 tons of cement while attempting to anchor just north of the entrance to Port Everglades, Fla. Using the historical AIS track data and real-time video coverage provided by Hawkeye, Sector Miami was able to monitor the lightering of 700 tons of fuel and salvage operations until the vessel was successfully refloated.

By leveraging the Hawkeye AIS information and additional AIS track data made available through the Coast Guard’s Research and

Development Center, investigators were able to retrace the path of the *Federal Pescadores* through the grounding and subsequent refloating. The AIS history was crucial in assessing damage to the fragile reef area and served as critical evidence to the incident investigation and briefings.

This same scenario was repeated with the May 2006 grounding of the *M/V Spar Orion*, while carrying 44,000 metric tons of cement during the same transit to the Port Everglades anchorage. Although both cases were event-driven, they confirmed the need for awareness of commercial traffic in the approaches to port and subsequent transits to terminals. As an operational prototype, the Hawkeye system confirmed an operational requirement for vessel tracking and the capability to be able to replay historical transits, a feature that will be built into future software versions under the spiral development engineering cycle for Hawkeye.

On December 19, 2005, Chalk's Ocean Airways flight 101 took off from Government Cut in Miami. As the seaplane neared the end of the jetties, the right wing detached and the plane crashed, killing all 20 passengers and crew members onboard. A Coast Guard Auxiliary watchstander captured footage of the last seconds of flight using one of Hawkeye's optical cameras. This media clip was immediately supplied to the FBI and the National Transportation Safety Board, who lauded the footage as crucial to the investigation because it had documented the last few seconds of flight, leading up to the accident. After reviewing the video, it was determined that the archival settings could be relaxed slightly in order to dramatically improve the quality of the video, a tradeoff that would significantly benefit future cases.

Spiral Development

The future of Hawkeye appears bright, with a new software version due out soon, a pending radar assessment by DHS Science and Technology, and an operational assessment by the Research and Development Center; evidence of the broad commitment to improving the current technology and evolving the SCC concept.

With greater staffing, standard operating procedures, and improved sensor coverage throughout the Sector Miami AOR, Hawkeye will continue to play a key role in the evolution of Maritime Domain Awareness.

About the author: LT Noggle is a 2001 graduate of the U.S. Coast Guard Academy, with a B.S. in Mechanical Engineering. He served his first tour aboard the CGC *Resolute* in St. Petersburg, Fla., followed by his assignment to Group Miami in 2003 as the communications officer. He was later named the sector command center chief.

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